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REMARKS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Prompt consideration and allowance of the claims is respectfully requested.

Status of Claims

Claims 1-12 are pending in the application and have been rejected.

No claims have been amended herein.

CLAIM REJECTIONS

35 U.S.C. § 102 Rejections

In the final Office Action, the Examiner maintained his rejection of claims 1-4 and 9 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,731,684 (Wu et al). Applicant traverses the Examiner's rejection of these claims.

It is respectfully submitted that the Examiner has made a material error in his interpretation of Wu. This error is encapsulated in the Examiner's statement that "Since Wu discloses for a scene change, to change the P-frame to an I-frame, it is clear to the Examiner that substituting the I-frame for the P-frame reads onto the claimed invention." The Examiner's rejection of claims 1-4 and 9 under 35 U.S.C. § 102(b) and rejection of claims 5-8 and 10-12 under 35 U.S.C. § 103(a) are founded on this misinterpretation. The Examiner's rejections are respectfully traversed.

Wu recognizes that the coding efficiency of an MPEG encoder can be improved if the leading I-frame in a group of pictures (GOP) is aligned with the start of a new scene. Wu recognizes existing scene change detection proposal. The contribution of Wu is that (column 2, lines 9-14):

Scene change detection is performed at a pre-processing stage of a video encoder. The final decision to encode a frame as an I-frame or a P-frame is not made until a final encoding stage. That is the encoders

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processing pipeline is used as a look-ahead buffer to minimize the amount of required frame buffer memory.

The intent of the Wu disclosure is that this final decision to encode a frame as an I-frame or P-frame is made with appropriate information regarding scene changes so that, wherever appropriate, an I-frame is aligned with the start of a new scene.

This function can be seen clearly in Figure 2. At the top of the figure is shown an encoder processing chain comprising pre-processing stage 205, PB frame re-ordering delay 215, motion estimation stage 220 and encoder stage 225. Input video entering the pre-processing stage 205 will be compressed in this processing chain and will output as an MPEG bitstream. The lower half of Figure 2, contains the functionality which is the contribution of Wu. It is important to note that the circuit elements shown in the lower half of Figure 2 (scene change detection 210, delay 230, scene change counter 240 and picture coding type decision 235) serves to provide only one input to the video compression processing chain. That input is the "picture-type" parameter output by the picture encoding type decision 235 to the encoding stage 225.

The compression processing chain in Figure 2 is conventional and – in the absence of the "picture type" parameter provided by the additional circuitry of Wu – would take decision regarding the location of I-frames. Thus, in a long unbroken scene, the location of I-frames would be decided in the compression processing chain. If a scene change is detected, the function of the additional circuitry of Figure 2 may result in a change of decision, that is to say a frame which would otherwise have been encoded as a P-frame may instead be encoded as an I-frame.

The Examiner has specifically drawn attention to the passage bridging columns 9 and 10 in Wu. This states:

Case 1a indicates resetting of the picture type based on the scene change detection for a frame sequence B, P, B, P, B. Specifically, in frame 4, the P-frame is changed to an I-frame. This indicates the start of a new GOP.

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Case 1b indicates resetting of the picture type based on the scene change detection for a frame sequence P, B, P, B, P. Specifically, in frame 3, the P-frame is changed to an I-frame.

It is critical to understand that when Wu uses the terminology "the P-frame is changed to an I-frame", the clear meaning is that a frame which in the absence of the scene change technology of Wu would have been encoded as a P-frame is in fact encoded as an I-frame. The "change" is nothing whatever to do with the creation of a synthetic field as proposed in the present invention. First, the "change" in Wu is a change in coding decision. That change in coding decision takes place before the frame has been compressed as either an I-frame or a B-frame. Secondly, the "change" is a philosophical rather than a real change; it is a change from what would have occurred if the scene change technology of Wu were not present.

To repeat, there is no transformation in Wu of a P-frame to an I-frame. Clearly, P-frames and I-frames exist in the output bitstream. Wu does not take a frame from the output bitstream which has been encoded as a P-frame and convert it into a frame compressed as I-frame. To the extent that Wu refers to frames of uncompressed video as "I, P or B", this, as would be understood by the skilled man, merely denotes the preliminary choice of encoding mode which will be used in the final coding stage on the video frame in question.

The requirement in claims 1 and 12 for the generation of a synthetic field is nowhere disclosed in Wu. Reconsideration and allowance of claims 1-4 and 12 is accordingly requested.

Claim 9 has similarly been rejected by the Examiner under 35 U.S.C. § 102(b) as being anticipated by Wu. It is again respectfully submitted that this rejection is founded upon a misunderstanding of the disclosure of Wu.

In finding Wu to disclose the claim feature of "where a cut occurs otherwise than at a frame boundary, retiming the cut", the Examiner has directed attention to delay 230 in Figure 2 of Wu. The Examiner states that the purpose of delay 230 is to compensate for the delay, particularly, blocks 215 and 220 of the compression processing chamber.

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The Examiner then makes the statement that the delay 230 would be capable of re-justing or re-timing a scene change. This statement lacks any foundation in Wu and is directly contrary to the expressed teaching of Wu. The purpose of delay 230 in Wu is to ensure that the picture coding decision is in precise register with the scene change.

It is important to note that the re-timing of a cut which is defined in claim 9 operates so that where the input fields exhibit a cut in the middle of a frame, the cut is re-timed so that in the output fields, the cut is positioned at a frame boundary. Wu does not disclose this processing and indeed the structure described in Wu is incapable of such processing. By way of still further confirmation that Wu does not operate to re-time cut that occurs in the middle of a frame, it is observed that Wu proposes an alternative approach to addressing the issue of cuts within a frame. Thus, attention is drawn to column 2, lines 43 to 46, in which it is proposed that in the case of a "bad edit" where a scene change occurs at the odd/even field boundary of a frame, the step is taken of switching from frame prediction to field prediction.

It is accordingly submitted that claims 9 and 10 distinguish patentably from Wu. Reconsideration and allowance of these claims is requested.

In the final Office Action, the Examiner also maintained his rejection of claims 5-8 and 10-12 under 35 U.S.C. § 103 as being unpatentable over Wu et al. in view of Holland et al. (U.S. Patent Application Publication No. 2003/0193614). Applicant traverses the Examiner's rejection of these claims.

In his analysis, the Examiner notes (correctly) that "Wu fails to teach the input sequence being automatically re-timed to occur at a frame boundary in the output sequence". The Examiner then found that the teaching of Holland would be capable of re-organising fields so that a cut was re-timed and forms the view that it would have been obvious to combine the method of Wu with the Holland field sequence generator "in order to provide an efficient method and system to correct a disrupted 2/3 video sequence".

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If the skilled reader of Wu were concerned to provide an efficient method and system to correct a disrupted 2/3 video sequence and were directed in this regard to the disclosure of Holland, the simple solution would be to pass the input video through the apparatus of Holland before it enters the pre-processing stage 205 of Wu. Such a combination would not fall within the scope of claim 5 and there would be no re-timing of a cut to occur at a frame boundary in the output sequence.

In relation to Figure 6, the Examiner makes the statement that "Wu discloses where a scene change is detected in a field, the P-frame is converted to I-frame. Converting the P-frame to the I-frame when a scene change is detected would force the scene change forward". This statement is false. It appears to follow from the misunderstanding noted earlier that Wu is "converting" P-frames to I-frames. When Wu detects a scene change, it leaves the location of that scene change unaltered. Wu looks at the first frame of the new scene. Wu then operates to ensure that the first frame in the new scene is encoded as an I-frame. The only "change" in the processing of that frame is at best a change of mind of whether to encode an a P-frame or an I-frame. Also this "change" is more philosophical than technical since the "change" is a difference only from what might have happened in the absence of the technology of Wu.

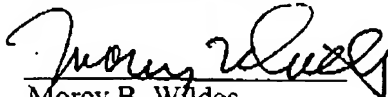
For the foregoing reasons, Applicants respectfully request reconsideration of claims 1-12.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

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Please charge any fees associated with this paper to deposit account No. 50-3355.

Respectfully submitted,



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Dated: September 21, 2008

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